

PATENT

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Applicant : Young CHOI et al.  
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A FOLDER IN A ROTATION TOUCH PHONE HAVING A  
CAMERA  
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**SUBMISSION OF CERTIFIED ENGLISH TRANSLATION OF PRIORITY  
DOCUMENT**

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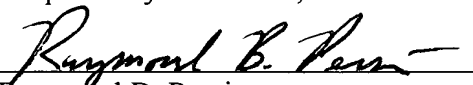
Sir:

Applicants submit herewith an English Translation of the Priority Document, including a Certificate of Translation, with respect to the Korean patent application No, 2003-6429 filed January 30, 2003.

Although no fees or charges are believed due, the Commissioner is hereby authorized to charge any fees which may become due in connection with this communication or credit any overpayment to Deposit Account No. 18-2220.

Respectfully submitted,

Date: February 23, 2006

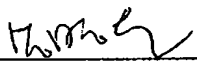
  
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# **CERTIFICATE OF TRANSLATION**

As a below named translator, I hereby declare that my residence and citizenship are as stated below next to my name and I hereby certify that I am conversant with both the English and Korean languages and the document enclosed herewith is a true English translation of the Priority Document with respect to the Korean patent application No. **2003-6429** filed on **January 30, 2003**.

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*Translation of Priority Document*

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Application Number : Korean Patent Application No. 2003-6429

Date of Application : January 30, 2003

Applicant(s) : Samsung Electronics Co., Ltd.

February 22, 2006

**COMMISSIONER**

## **[ABSTRACT OF THE DISCLOSURE]**

### **[ABSTRACT]**

Disclosed is a method for detecting a position of a folder in a rotation touch phone having a camera. The rotation touch phone includes a sensor section, a folder, a body, and a connecting section. The folder has a magnet and the sensor section includes first to third sensors for detecting the magnet. The first and second sensors are located on the body and the third sensor is located on the connecting section. The connecting section connects the folder to the body. The folder is movable from first to fourth states. The first state signifies a state in which the folder is initially closed, the second state signifies a state in which the folder has been opened from the first state, the third state signifies a state in which the folder has been rotated 180 degrees from the second state, and the fourth state signifies a state in which the folder has been closed from the third state. The method comprises the steps of: i) receiving a signal from the sensor section notifying that the sensor section detects the magnet; and ii) deciding that the folder is in at least one of the first to fourth states, based on the signal inputted from the sensor section.

### **[REPRESENTATIVE FIGURE]**

FIGURE 5

### **[INDEX]**

Sensor, Magnet, Folder, Touch Screen, Speakerphone

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**[SPECIFICATION]**

**[TITLE OF THE INVENTION]**

METHOD FOR DETECTING POSITION OF FOLDER IN  
ROTATION TOUCH PHONE HAVING CAMERA

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**[BRIEF DESCRIPTION OF THE DRAWINGS]**

The above objects and other features and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

10        FIGs. 1A to 1C are perspective views showing a rotational state of a folder of a rotation touch phone having a camera according to one embodiment of the present invention;

          FIGs. 1D to 1F are a front perspective, a rear perspective, and a side views a rotation touch phone having a camera according to one embodiment of  
15 the present invention;

          FIG. 2 is a block diagram showing an internal structure of a rotation touch phone having a camera according to one embodiment of the present invention;

          FIG. 3 is a flow chart showing an operation of a rotation touch phone  
20 having a camera in a speaker mode according to one embodiment of the present invention;

          FIG. 4 is a view showing a speaker mode setting image displayed on a screen of a rotation touch phone having a camera according to one embodiment of the present invention in a speaker mode;

25        FIG. 5 is a flow chart showing a method for converting a rotation touch phone having a camera into a speakerphone according to one embodiment of the present invention; and

          FIG. 6 is a flow chart showing a method for utilizing a display section as an illumination when photographing an object by using a rotation touch phone  
30 having a camera according to another embodiment of the present invention.

**[DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT]**

**[OBJECT OF THE INVENTION]**

**[RELATED FIELD AND PRIOR ART OF THE INVENTION]**

The present invention relates to a rotation touch phone having a camera,  
5 more particularly to a method for detecting a rotational state of a folder in a touch  
phone having a camera.

Recently, cellular phones have been equipped with cameras and  
camcorders to provide various additional services in addition to the basic  
10 communication service. In a cellular phone having a camera or a camcorder, a  
folder coupled to the cellular phone can be rotated when photographing an image  
by using the cellular phone, thereby improving convenience of use.

However, in order to make a communication by using such a rotation  
15 type cellular phone having a camera in a state in which the folder has been  
rotated, a user must align a speaker and a microphone in the same direction.  
That is, the user is required to rotate the folder to its normal position for making  
the communication. Thus, when the folder of the rotation cellular phone is in a  
rotated state, the user must return the folder to its normal position before making  
20 communication with other users. In addition, when the user photographs an  
object in a dark place with the camcorder or the camera without a flash, it is  
difficult to obtain distinct images.

**[SUBSTANTIAL MATTER OF THE INVENTION]**

25 Accordingly, the present invention has been made to solve the above-  
mentioned problems occurring in the prior arts, and a first object of the present  
invention is to provide a method for detecting a position of a folder in a rotation  
touch phone having a camera.

30 A second object of the present invention is to provide a method for

converting a rotation touch phone having a camera into a speakerphone depending on a position of a folder.

5 A third object of the present invention is to provide a method for utilizing a display section as an illumination depending on a position of a folder when photographing an object by using a rotation touch phone having a camera.

In order to accomplish the above objects, there is provided a method for detecting a folder position in a rotation touch phone having a camera. The  
10 rotation touch phone includes a sensor section, a folder, a body, and a connecting section. The folder has a magnet and the sensor section includes first to third sensors for detecting the magnet. The first and second sensors are located on the body and the third sensor is located on the connecting section. The connecting section connects the folder to the body. The folder is movable  
15 from first to fourth states. The first state signifies a state in which the folder is initially closed, the second state signifies a state in which the folder has been opened from the first state, the third state signifies a state in which the folder has been rotated 180 degrees from the second state, and the fourth state signifies a state in which the folder has been closed from the third state. The method  
20 comprises the steps of: i) receiving a signal from the sensor section notifying that the sensor section detects the magnet; and ii) deciding that the folder is in at least one of the first to fourth states, based on the signal inputted from the sensor section.

## 25 [CONSTRUCTION AND OPERATION OF THE INVENTION]

Hereinafter, a preferred embodiment of the present invention will be described with reference to the accompanying drawings. In the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the  
30 subject matter of the present invention rather unclear.

FIGs. 1A to 1C are perspective views showing a rotational state of a folder of a rotation touch phone having a camera according to one embodiment of the present invention. The rotation touch phone having the camera is a folder type wireless communication terminal having a folder capable of rotating  
5 through 360 degrees and a touch screen.

Referring to FIGs. 1A to 1C, the rotation touch phone having the camera includes a body 122, a folder 121, and a connection section 123. The body 122 has a microphone 102, a key input section 227, and an ear-jack 103. Hall effect  
10 ICs are accommodated in the body 122. The hall effect ICs can detect magnetic material, such as a magnet 111. Preferably, three hall effect ICs are provided. Two hall effect ICs are accommodated in the body 122 and remaining one is provided at the connection section 123. In the present embodiment, two hall effect ICs accommodated in the body 122 are defined as first and second sensors  
15 112 and 113. The connection section 123 consists of a rotary hinge and one hall effect IC. The hall effect IC is provided at an inner portion of the connection section 123 and is defined as a third sensor 114. In addition, the connection section 123 includes a camera 250. The folder 121 has a speaker 101, a touch screen and the magnet 111.

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Although the speaker 101 is generally used for hearing a voice of other users, the speaker 101 according to the present invention has a speakerphone function. The speaker 101 described below is a bi-directional speaker having the function of the speakerphone. In addition, although it is described that the  
25 magnet 111 is used as magnetic material, other magnetic material can be used instead of the magnet 111.

Hereinafter, a rotational state of the folder 121 in the rotation touch phone including the body 122, the connection section 123, and the folder will be  
30 described. In the following description, a first state signifies a state in which



the folder 121 of the rotation touch phone having the camera is initially closed, a second state signifies a state in which the folder 121 has been opened in an “A” direction, a third state signifies a state in which the folder 121 has been rotated in a “B” direction from the second state, and a fourth state signifies a state in which  
5 the folder 121 has been closed in a “C” direction from the third state.

Table 1 shows an operation of the rotation touch phone having the camera according to a position of the folder.

10      Table 1

State of folder	1st sensor	2nd sensor	3rd sensor	Operation
1st state	HIGH	LOW	LOW	1st display section OFF, 2nd display section ON, key input OFF, touch screen ON
2nd state	LOW	LOW	LOW	1st display section ON, 2nd display section ON, key input ON, touch screen ON
3rd state	LOW	LOW	HIGH	1st display section ON, 2nd display section ON, key input ON, touch screen OFF, rear speaker ON in communication
4th state	LOW	HIGH	HIGH	1st display section ON, 2nd display section OFF, key input OFF, touch screen ON, speaker ON in communication

Referring to table 1, in the rotation touch phone having the camera, if the magnet 111 reaches the sensors, each sensor displays “HIGH”, and if the magnet 111 is remote from the sensors, each sensor displays “LOW”. Since the folder  
15 121 is closed in the first state, the first display section, the key input section and the touch screen do not operate. However, a side-key can be operated in order to

make a communication. The first and second display sections include an LCD (liquid crystal display) having a touch screen function.

Since the folder 121 is opened in the second state, the first and second  
5 display sections and the key input section can be operated. In the third state, in which the folder 121 is rotated an angle of 360 degrees from the second state, the first and second display sections and the touch screen can be operated and the key input is possible. In the second and third states, the first and second display sections can be used as an illumination when the rotation touch phone is  
10 converted into a camera mode. A method for utilizing the first and second display sections as the illumination will be described in detail with reference to FIG. 6. In the fourth state, in which the folder 121 is moved into a closed position from the third state, the first display section and the touch screen can be operated and the second display section does not operate and the key input is  
15 impossible. An operation of the rotation touch phone having the camera according to a state of the folder 121 will be described in detail with reference to FIGs. 5 and 6.

FIGs. 1D to 1F are a front perspective, a rear perspective, and a side  
20 views a rotation touch phone having a camera according to one embodiment of the present invention. Hereinafter, an operation of the camera and a photographing method thereof will be described with reference to FIG. 1B.

FIG. 1D is a front view of the rotation touch phone showing the first  
25 display section and the camera 250 in the second state. FIG. 1E is a rear view of the rotation touch phone, in which the camera 250 is rotated in an "E" direction after the body of the rotation touch phone is rotate at an angle of 180 degrees in a "D" direction. The camera 250 can be rotated. FIG. 1F is a side view of the rotation touch phone having the camera, in which a "G" direction represents a  
30 photographing direction of the camera 250 when the rotation touch phone is

maintained as shown in FIG. 1D, and an “F” direction represents a photographing direction of the camera 250 when the rotation touch phone is maintained as shown in FIG. 1E. In FIG. 1F, an “H” direction represents an illumination direction radiated from the second display section, which will be further  
5 described later with reference to FIG. 6.

FIG. 2 is a block diagram showing an internal structure of the rotation touch phone having the camera according to one embodiment of the present invention. Hereinafter, the internal structure of the rotation touch phone will be  
10 described with reference to FIGs. 1A and 2.

Referring to FIG. 2, an RF section 221 is provided to allow the rotation touch phone to make a communication. The RF section 221 includes an RF transmitter for boosting and amplifying the frequency of a transmitted signal, and  
15 an RF receiver for low-noise amplifying a received signal and descending the frequency of the received signal. A data processing section 223 includes a transmitter for encoding and modulating the transmitted signal and a receiver for decoding and demodulating the received signal. In addition, the data process  
233 consists of a MODEM and a CODEC. An audio processing section 225  
20 reproduces an audio signal outputted from the data processing section 223 or transmits an audio signal generated from the microphone 102 to the data processing section 223.

The key input section 227 includes input keys for inputting numerical  
25 numbers and character information and various functional keys for setting various functions. The key input section 227 has a navigation key for selecting a menu, a call key for making a communication, and an end key for finishing the communication. In addition, according to the preferred embodiment of the present invention, the key input section 227 has a speaker mode selecting key, a  
30 speak auto-mode selecting key, a speaker manual-mode selecting key and a

camera mode selecting key. A memory 229 includes a program memory and a data memory. The program memory stores programs for controlling an operation of the rotation touch phone having the camera. In addition, the data memory temporarily stores data created when the programs are executed. A  
5 control section 210 includes the data processing section 223 and controls the operation of the rotation touch phone having the camera. In addition, the control section 210 controls the operation of a liquid crystal display device, the key input section 227, and the touch screen, and allows the rotation touch phone to be converted into a speakerphone mode.

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The sensor section 231 transfers signals detected by the first to third sensors 112, 113 and 114 to the control section 210. The sensors detect signals as the magnet 111 approaches.

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The camera 250 photographs image data and has a camera sensor for converting an optical signal to an electric signal. The camera sensor includes a CCD sensor. Although a camera 250 accommodated in the rotation touch phone is described, it is also possible to install a camera 250 to an exterior of the rotation touch phone. A signal processing section 260 converts a signal inputted  
20 from the camera 250 into an image signal. The signal processing section 260 includes a digital signal processor. An image processing section 270 generates screen data for displaying the image signal outputted from the signal processing section 260. The image processing section 270 transmits the image signal, which is received in the image processing section 270 controlled by the control  
25 section 210, corresponding to sizes of the first and second display sections 280 and 290, and compresses or expands image data.

The first and second display sections 280 and 290 display messages generated when the programs are executed under the control of the control  
30 section 210. The first and second display sections 280 and 290 include an LCD.

In this case, the first and second display sections 280 and 290 include an LCD controller, a memory for storing data and an LCD display device. If a touch screen type LCD is adopted, the key input section 227 and the LCD act as an input section. For example, a speaker manual mode is selected, the user cannot  
5 use the key input section 227 in the fourth state so that the user inputs signals by using the touch screen. The first and second display sections 280 and 290 can be used as an illumination for the camera 250 when the rotation touch phone is converted into a camera mode in second and third states, which will be described in detail with reference to FIG. 6.

10

Hereinafter, the operation of the rotation touch phone having the camera will be described. When outgoing a call, the user inputs a phone number through the key input section 227 and sets a call outgoing mode. Then, the control section 210 detects the call outgoing mode and processes phone number  
15 information through the data processing section 223, thereby outputting an RF signal through the RF section 221. If a receiver sends a response signal, the control section 210 detects the response signal through the RF section 221 and the data processing section 223. Then, a voice communication path is formed by means of the audio processing section 225 so that the user can make a  
20 communication with the receiver. In addition, when an incoming call is received, the control section 210 detects the incoming call through the data processing section, thereby generating a ring signal through the audio processing section 225. Then, if the user responds to the incoming call, the control section 210 forms the voice communication path through the audio processing section  
25 225, so that the user can make a communication with the transmitter. In addition, the data input can be carried out by using the touch screen in the fourth state. In a communication-waiting mode or a character communication is carried out, the control section 210 controls the data processing section 223 in such a manner that character data are displayed in the first and second display  
30 sections 280 and 290.

FIG. 3 is a flow chart showing an operation of the rotation touch phone having the camera in a speaker mode according to one embodiment of the present invention. Hereinafter, a process for setting the speak mode in which a speakerphone can be used will be described with reference to FIGs. 1A to 1C, 2  
5 and 3.

Firstly, the control section 210 checks whether or not a key signal is inputted from the key input section 227 (S301). If the inputted key signal is not a speaker mode selecting key signal, an initial state is maintained. If the  
10 inputted key signal is the speaker mode selecting key signal, a speaker mode image is displayed on the screen (S302). The speaker mode selecting key signal is generated when the user pushes a speaker mode selecting key of the key input section 227 or touches the touch screen. The speaker mode selecting key includes a navigation key, a number key, and a special key. Although the  
15 present invention is mainly described with reference to key signals of the key input section 227, key signals of the touch screen are also utilized. In step 302, the speaker mode image is displayed on the first display section 280 or the second display section 290 under the control of the control section 210. The first and second display sections 280 and 290 display the speaker mode image as  
20 shown in FIG. 4.

FIG. 4 is a view showing the speaker mode image displayed on the screen of the rotation touch phone having the camera according to one embodiment of the present invention in a speaker mode. Referring to FIG. 4, a  
25 speaker mode is divided into a speaker auto-mode and a speaker manual-mode. The user can select the speaker mode by using the key input section 227 or by touching an auto-mode 401 or a manual-mode 402 formed in the touch screen.

In step 303, the control section 210 checks whether or not the key signal  
30 is inputted from the key input section 227. If the inputted key signal is not a

speaker auto-mode key signal, step 305 is carried out. In addition, if the inputted key signal is the speaker auto-mode key signal, step 304 is carried out. The speaker auto-mode key signal is generated when the user pushes a speaker auto-mode key of the key input section 227. The speaker auto-mode key  
5 includes a navigation key for selecting a menu, a number key, and a special key. In step 304, the control section 210 sets the speaker auto-mode. The speaker auto-mode allows the user to make a communication by using the speaker 101 and the microphone 102, or by using only the speaker 101 depending on positions (first to fourth states) of the folder 121 in the rotation touch phone  
10 having the camera. The speaker auto-mode will be described in detail with reference to FIG. 5.

In step 305, the control section 210 checks whether or not the key signal is inputted from the key input section 227. If the inputted key signal is not a  
15 speaker manual-mode key signal, step 307 is carried out. In addition, if the inputted key signal is the speaker manual-mode key signal, step 306 is carried out. The speaker manual-mode key signal is generated when the user pushes a speaker manual-mode key of the key input section 227. The speaker manual-mode key includes a navigation key for selecting a menu, a number key, and a  
20 special key. In step 306, the control section 210 sets the speaker manual-mode. In the speaker manual-mode, the user operates the key input section or the touch screen in order to use the speaker 101 and the microphone 102 (normal communication mode) or to use only the speaker 101 (speakerphone mode) depending on positions (first to fourth states) of the folder 121 in the rotation  
25 touch phone having the camera. The speaker manual-mode will be described in detail with reference to FIG. 5.

In step 307, the control section 210 checks whether or not predetermined time lapses. If predetermined time has been passed, the control section 210  
30 performs step 308. Otherwise, step 302 is carried out. The predetermined time

lapse means that the key signal is not inputted from the key input section 227 during the speaker mode. In step 308, the control section 210 sets the initial speaker mode. The initial speaker mode means the speaker auto-mode or the speaker manual-mode, which haven been previously set. For example, if a  
5 previous mode is the speaker manual-mode, a notification “set as initial speaker manual-mode” is displayed in the first display section 280 or in the second display section 290 as shown in FIG. 4.

FIG. 5 is a flow chart showing a method for converting the rotation touch  
10 phone having the camera into the speakerphone according to one embodiment of the present invention. Hereinafter, a method for making communication by using the speakerphone in the speaker auto-mode and speaker manual-mode will be described with reference to FIG. 5. First of all, an operation of the control section 210 in the speaker auto-mode will be described.

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In step 501, the control section 210 checks whether or not the key signal is inputted from the key input section 227. If the inputted key signal is not a communication key signal, an initial state is maintained. If the inputted key signal is the communication key signal, step 502 is carried out. The  
20 communication key signal means a key signal requiring a communication. The communication key includes an identification key having a side-key, a number key and a special key.

In step 502, the control section checks whether or not an earphone 104 is  
25 connected to the ear-jack 103. If the earphone 104 is not connected to the ear-jack 103, step 504 is carried out. If the earphone 104 is connected to the ear-jack 103, step 503 is carried out. In step 503, the control section 210 allows the user to make a communication through the earphone 104.

30 The control section 210 detects a rotational angle (rotational position) of



the folder 121 in step 504 and then proceeds to step 505. The rotational angles (rotational positions) of the folder 121 can be classified into a zero angle, a 180 degree angle, and an angle between zero and 180 degrees. The zero angle represents either the first state or the second state. The 180 degree angle represents either the third state or the fourth state. The angle between zero and 180 degree represents a state in which the folder 121 is being rotated or brought to a halt while being rotated, which corresponds to neither of the first to fourth states. Herein, the angle between zero and 180 degrees can be recognized by means of the third sensor 114. That is, the angle between zero and 180 degrees represents neither of the first to fourth states but a state in which the third sensor 114 has not detected the magnet 111. The first to fourth states have been described above.

In step 505, the control section 210 checks whether or not the rotational angle of the folder 121 is zero. If the rotational angle of the folder 121 is not zero, the control section 210 carries out step 511. In addition, if the rotational angle of the folder 121 is zero, the control section 210 carries out step 506. Checking the rotational angle of the folder 210 by using the control section 210 means that the control section 210 detects the position of the folder 121. That is, the control section 210 detects signals inputted from the sensor section 231 having the first to third sensors 112, 113 and 114, thereby determining the first to fourth states of the folder 121.

In step 506, the control section checks 210 whether or not the sensor section 231 detects the signal from the first sensor 112. If the sensor section 231 does not detect the signal from the first sensor 112, step 508 is carried out. In addition, if the sensor section 231 detects the signal from the first sensor 112, the control section 210 carries out step 507. Step 507 represents the first state, in which the folder 121 is closed and only the first sensor 112 detects the magnet 111. Step 508 represents the second state, in which the folder 121 is opened and

none of the first to third sensors 112 to 114 detect the magnet. Then, the sensor section 231 checks whether or not the first sensor 112 has detected the magnet 111. If the first sensor 112 does not detect the magnet 111, the sensor section 231 does not transfer a signal to the control section. In addition, if the first  
5 sensor 112 detects the magnet 111, the sensor section 231 transfer a signal to the control section 210 notifying that the sensor section 231 detects the signal from the first sensor 112.

In step 507, the control section 210 detects the closing of the folder 121  
10 and carries out step 509. In step 507, the control section 210 detects the first state of the folder 121. In step 508, the control section 210 detects the open of the folder 121 and carries out step 509. In step 508, the control section 210 detects the second state of the folder 121. In step 509, the control section 210 detects the first or second state of the folder 121, thereby allowing the user to  
15 make communication through the speaker 101 and a microphone 102, and then, carries out step 510. That is, in step 509, the user can make the communication with other users through the speakerphone (speaker 101) in the first state. In addition, the user can make communication with other users through the speakerphone or through the speaker 101 and the microphone 102 in the second  
20 state.

In step 511, the control section checks whether or not the rotational angle of the folder 121 is 180 degrees. If the rotational angle of the folder 121 is not 180 degrees, step 512 is carried out. In addition, if the rotational angle of the  
25 folder 121 is 180 degrees, the control section 210 carries out step 513. Checking the rotational angle of the folder 210 by using the control section 210 means that the control section 210 detects the position of the folder 121. That is, the control section 210 detects signals inputted from the sensor section 231 having the first to third sensors 112, 113 and 114, thereby determining the first to  
30 fourth states of the folder 121. Specifically, when the third sensor 114 detects

the magnet 111, the control section decides that the rotational angle of the folder 121 is 180 degrees.

In step 513, the control section 210 checks whether or not the sensor section 231 detects signals from the second and third sensors 113 and 114. If the sensor section 231 detects only the signal from the third sensor 114, step 515 is carried out. In contrast, if the sensor section 231 detects the signals from both the second and third sensors 113 and 114, the control section 210 carries out step 514. Then, the sensor section 231 checks whether or not the second sensor 113 detects the magnet 111. If the second sensor 113 does not detect the magnet 111, the sensor section 231 does not transfer a signal to the control section 210. In contrast, if the second sensor 114 detects the magnet 111, the sensor section 231 transfers a signal to the control section 210 notifying that the sensor section 231 has detected the signal from the second sensor 113.

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In step 514, the control section 210 detects the close of the folder 121 and carries out step 516. In step 514, the control section 210 detects the fourth state of the folder 121 in which both the second and third sensors 113 and 114 detect the magnet 111. In step 515, the control section 210 detects opening of the folder 121 and carries out step 516. In step 515, the control section 210 detects the third state of the folder 121 in which only the third sensor 114 detects the magnet 111. In step 516, the control section 210 detects the third and fourth states of the folder 121, thereby allowing the user to make a communication through the speakerphone (speaker 101), and then, carries out step 510.

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In step 510, the control section 210 checks whether or not the rotational angle of the folder is varied while making the communication with other users. If the rotational angle of the folder is not varied while making the communication with other users, the process is finished. In addition, if the rotational angle of the folder is varied while making the communication with other users, the control

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section 210 repeatedly carries out step 504. The finish of the process means that step 509 or step 516 is maintained. In addition, the variation of the rotational angle of the folder means that the user rotates the folder 121 while making communication. For example, the user may make communication with other users in the second state by using the speaker 101 and the microphone 102. However, if the user rotates the folder 121 at an angle of 180 degrees (third state), or closes the rotated folder 121 (fourth state), the control section 210 allows the user to make the communication through the speakerphone (speaker 101). That is, the user makes the communication by using the microphone 102 and the speaker in the second state, and makes the communication by using the speakerphone (speaker 101) in the third or fourth state. For example, the folder position is changed from the second state to the third state, the control section 210 automatically converts the rotation touch phone into a speakerphone mode, thereby allowing the user to continuously make the communication with other users.

Hereinafter, an operation of the control section 210 in the speaker manual-mode will be described with reference to FIGs. 1A and 2. As described above, the first state means that the folder 121 is closed, the second state means that the folder 121 is opened in an “A” direction as shown in FIG. 1A, the third state means that the folder 121 is rotated in a “B” direction as shown in FIG. 1A from the second state, and the fourth state means that the folder 121 is closed in a “C” direction as shown in FIG. 1B from the third state.

The speaker manual-mode allows the user to make the communication with other users by using the speaker 101 and the microphone 102, or by using the speaker 101 through inputting key signals into the key input section 227 or touching the touch screen. The following description is described on the assumption that the user sets the speaker manual-mode and an incoming call is received from a transmitter.

Firstly, the control section 210 checks whether or not the key signal of the key input section 227 or the touch signal of the touch screen is inputted. As a result of the checking, if the inputted signal is not a response signal for the incoming call, an initial state is maintained. In contrast, if the inputted signal is the response signal for the incoming call, the control section 210 forms a communication path for allowing the user to make communication with the transmitter.

When forming the communication path between the user and the transmitter, if the folder 121 is in the first state, the user opens the folder 121 (second state) to communicate with the transmitter. If the folder 121 is in the second state, the user inputs the key signal of the key input section 227 and the touch signal of the touch screen to communicate with the transmitter. In the third state, the user inputs the key signal of the key input section 227 and the touch signal of the touch screen to communicate with the transmitter. In the fourth state, the user pushes a side-key of the key input section 227 or touches a communication section of the touch screen to communicate with the transmitter.

In the fourth state, the user is required to use the speakerphone in order to communicate with the transmitter, so that the user touches a speaker section formed on the touch screen or pushes the key of the key input section to communicate with the transmitter through the speakerphone (speaker 101).

FIG. 6 is a flow chart showing a method for utilizing the display section as an illumination when photographing an object by using the rotation touch phone having the camera according to another embodiment of the present invention. Hereinafter, the method for utilizing the first or second display section 280 or 290 as the illumination when photographing the object will be described with reference to FIGs. 1A, 1B, 2 and 6.

Firstly, the control section checks whether or not a camera mode key signal is inputted from the key input section 227 (s601). If the signal inputted from the key input section 227 is not the camera mode key signal, an initial state is maintained. In addition, if the signal inputted from the key input section 227 is the camera mode key signal, the control section carries out step 602. In step 602, the control section converts the rotation touch phone into a camera mode and carries out step 603. The camera mode relates to the photographing work of the camera 250, and allows the user to easily preview images or conveniently photograph the object.

In step 603, the control section checks whether or not the folder 121 is positioned in the second state. If the folder 121 is not positioned in the second state, step 605 is carried out. In addition, if the folder 121 is positioned in the second state, the control section carries out step 604. In the second state, the folder 121 is opened in the “A” direction as shown in FIG. 1A. In step 604, the control section controls the second display section 290 in such a manner that the second display section 290 radiates light having higher brightness. That is, when the photographing direction of the camera 250 is formed in the “F” direction as shown in FIG. 1F, the control section 210 controls the second display section 290 to radiate light having brightness higher than brightness of general use, thereby facilitating the photographing work of the camera 250. To recognize the second state of the folder 121, the control section 210 checks whether or not the sensor section 231 detects signals generated from the first to third sensors 112, 113 and 114. If the sensor section 231 does not detect the signals from the first to third sensors 112, 113 and 114, the sensor section 231 cannot transfer a signal to the control section 210, so the control section 210 determines that the folder 121 is positioned in the second state.

In step 605, the control section 210 checks whether or not the folder 121

is positioned in the third state. If the folder 121 is not positioned in the third state, the control section 210 finishes the process. In addition, if the folder 121 is positioned in the third state, the control section 210 carries out step 606. The third state of the folder 121 is achieved by rotating the folder 121 in the “B”  
5 direction from the second state as shown in FIG. 1B.

In step 606, the control section 210 controls the first display section 280 in such a manner that the first display section 280 radiates light having higher brightness. That is, when the photographing direction of the camera 250 is  
10 formed in the “F” direction as shown in FIG. 1F, the control section 210 controls the first display section 280 to radiate light having brightness higher than brightness of general use, thereby facilitating the photographing work of the camera 250. To recognize the third state of the folder 121, the control section 210 checks whether or not the sensor section 231 detects signals generated from  
15 the first to third sensors 112, 113 and 114. If the sensor section 231 does not detect the signals from the first and second sensors 112 and 113, but detect the signal from the third sensor 114, the sensor section 231 transfers a signal to the control section 210 notifying that the sensor section 231 detects the signal from the third sensor 114, so the control section 210 determines that the folder 121 is  
20 positioned in the third state.

As shown in FIG. 1F, if the user photographs the object in the “F” direction by using the camera 250, the first or second display section 280 or 290 radiates light having brightness remarkably stronger than brightness of general  
25 use in the “H” direction.

While the invention has been shown and described with reference to certain preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without  
30 departing from the spirit and scope of the invention as defined by the appended

claims.

### **[EFFECTS OF THE INVENTION]**

As described above, when the folder of the rotation cellular phone is in a rotated  
5 state, the user must return the folder to its normal position before making  
communication with other users, but the present invention provides a method to  
make a communication by converting rotation cellular phone into a speakerphone  
detecting a rotational state of a folder. Furthermore, the present invention is to  
provide a method for utilizing a display section as an illumination depending on a  
10 position of a folder when photographing an object by using a rotation touch phone  
having a camera for user to obtain distinct images in a dark place.



## [PATENT CLAIMS]

1. A method for detecting a folder position in a rotation touch phone having a camera, the rotation touch phone including a sensor section, a folder, a body, and a connecting section, the folder having a magnet, the sensor  
5 section including first to third sensors for detecting the magnet, the first and second sensors being located on the body and the third sensor being located on the connecting section, the connecting section connecting the folder to the body, the folder being movable from first to fourth states, the first state signifying a state in which the folder is initially closed, the second state signifying a state in  
10 which the folder has been opened from the first state, the third state signifying a state in which the folder has been rotated 180 degrees from the second state, the fourth state signifying a state in which the folder has been closed from the third state, the method comprising the steps of:

i) receiving a signal from the sensor section notifying that the sensor  
15 section detects the magnet; and  
ii) deciding that the folder is in at least one of the first to fourth states, based on the signal inputted from the sensor section.

2. The method as claimed in claim 1, wherein step i) includes the  
20 substeps of:

a) transferring a signal notifying that the first sensor detects the magnet;  
b) transferring a signal notifying that the second sensor detects the  
magnet; and  
c) transferring a signal notifying that the third sensor detects the magnet.

25

3. The method as claimed in claim 1, wherein step ii) includes the substeps of:

a) deciding that the folder is in the first state in which the folder is closed, when only the first sensor detects the magnet;  
30 b) deciding that the folder is in the second state in which the folder has

been opened, when none of the first to third sensors detect the magnet;

c) deciding that the folder is in the third state in which the folder has been rotated 180 degrees, when only the third sensor detects the magnet; and

d) deciding that the folder is in the fourth state in which the folder is closed, when both the second and third sensors detect the magnet.

4. A method for converting a mode of a rotation touch phone having a camera into a speakerphone mode by detecting a folder position, the rotation touch phone including a sensor section, a folder, a body, and a connecting section, the folder having a magnet and a bi-directional speakerphone, the sensor section including first to third sensors for detecting the magnet, the first and second sensors being located on the body and the third sensor being located on the connecting section, the connecting section having the camera and connecting the folder to the body, the folder being movable from first to fourth states, the first state signifying a state in which the folder is initially closed, the second state signifying a state in which the folder has been opened from the first state, the third state signifying a state in which the folder has been rotated 180 degrees from the second state, the fourth state signifying a state in which the folder has been closed from the third state, the method comprising the steps of:

i) converting the mode of the rotation touch phone into the speakerphone mode when the first sensor detects the magnet, which represents that the folder is in the first state in which the folder is closed; and

ii) converting the mode of the rotation touch phone into the speakerphone mode when the second sensor detects the magnet, which represents that the folder is in the fourth state in which the folder is closed by being rotated from the third state.

5. A method for utilizing first and second display sections as an illumination source when photographing an object by detecting a position of a

folder in a rotation touch phone having a rotatable camera, the rotation touch phone including a sensor section, a folder, a body, and a connecting section, the folder having a magnet and the first and second display sections, the sensor section including first to third sensors for detecting the magnet, the first and  
5 second sensors being located on the body and the third sensor being located on the connecting section, the connecting section connecting the folder to the body and having the camera, the folder being movable from first to fourth states, the first state signifying a state in which the folder is initially closed, the second state signifying a state in which the folder has been opened from the first state,  
10 the third state signifying a state in which the folder has been rotated 180 degrees from the second state, the fourth state signifying a state in which the folder has been closed from the third state, the method comprising the steps of:

i) deciding that the folder is in at least one of the first to fourth states, when the sensor section inputs a signal notifying that the sensor section detects  
15 the magnet; and  
ii) utilizing at least one of the first and second display sections as the illumination source when the folder is in at least one of the second and third states.

20 6. The method as claimed in claim 5, wherein step ii) includes the substeps of:

a) utilizing the second display section as the illumination source when the folder is in the second state; and  
b) utilizing the first display section as the illumination source when the  
25 folder is in the third state.